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## Spatio-temporal growth of garlic and onion crops in Gujarat

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### Abstracts

The growth in area, production and yield of onion and garlic in different districts of Gujarat was studied. The secondary data for the period from 1990–91 to 2007–08 was collected and analyzed. The annual area, production and productivity of onion significantly increased at the rate of 6.50%, 9.96% and 0.68%, respectively. In case of garlic, the annual growth was 2.98%, 4.61% and 1.52%, respectively.

**Keywords:** garlic, growth rate, onion

Garlic is an important spice and condiment crop cultivated mainly in Rajkot, Junagadh, Jamnagar and Amreli districts of Gujarat. During 2009–10, the production of garlic was 0.94 lakh tonnes from 0.15 lakh ha in the state. Onion is another important spice mainly grown in Bhavnagar, Junagadh, Rajkot, Jamnagar, Amreli, Porbandar and Surendranagar districts of Gujarat. During 2009–10, it was grown in 0.39 lakh ha with a production of 10.58 lakh tonnes. Keeping this in view, we studied the growth in area, production and yield of onion and garlic in different districts of Gujarat.

The study was based on secondary data for the period from 1990–91 to 2007–08 compiled from the various reports published by Bureau of Economics and Statistics, Directorate of Agriculture, Government of Gujarat, Gandhinagar. The following functional form was used for estimating the annual growth rate

of area, production and yield of onion and garlic.

$$Y = ab^t$$

Where, Y=dependent variable (area, yield, production); a=constant; t=time, j 1,2,...n, where n is the number of years; b=the parameter to be estimated. The exponential function was transformed to the semi log model and estimated using ordinary least square (OLS).

The compound growth rates of onion are presented in Table 1. It is observed that Valsad, Kheda and Sabarkantha districts registered negative and significant growth, while other districts registered positive growth in area among which, Surat had the highest annual growth rate of 11.93%. The area under the crop significantly increased at the rate of 6.50% per annum in Gujarat. Similar trend was also observed in production in which Surat district registered positive and significant annual

**Table 1.** Compound growth rates in area, production and yield of onion in different districts of Gujarat

Districts	1990–91 to 2007–08		
	Area	Production	Yield
Amreli	6.36** (1.0290)	5.53** (1.0882)	0.29 (0.1526)
Banaskantha	2.66** (0.3814)	11.45** (0.6436)	0.45** (0.1369)
Bhavnagar	4.88** (0.6384)	6.11** (0.7329)	1.15** (0.1435)
Jamnagar	10.23** (0.6519)	9.91** (0.6915)	-3.48** (0.5437)
Junagadh	10.83** (0.5543)	10.03** (0.6075)	-1.17** (0.1059)
Kheda	-3.16** (0.6072)	-1.99** (0.6738)	0.45** (0.1369)
Mehsana	1.97** (0.5884)	2.78** (0.6948)	2.30** (0.2079)
Panchmahals	4.61** (0.6362)	4.33** (0.6428)	0.45** (0.1369)
Rajkot	4.55** (0.9390)	5.35** (0.9856)	0.43** (0.1680)
Sabarkantha	-2.47** (0.3838)	6.11** (1.1189)	0.88** (0.1227)
Surat	11.93** (0.4339)	13.21** (0.3749)	0.81** (0.1469)
Vadodara	2.50** (0.4413)	5.49** (0.7644)	0.45** (0.1369)
Valsad	-2.12** (0.3258)	3.76** (0.7741)	0.45** (0.1369)
Gujarat	6.50** (0.4948)	9.96** (0.6310)	0.68** (0.1035)

\*Significant at  $P < 0.05$ ; \*\*Significant at  $P < 0.001$ ; Note: Figures in parentheses are standard errors

growth rate of 13.21%. The annual production of the state significantly increased at the rate of 9.96%. In case of annual productivity, only the districts of Jamnagar (-3.48%) and Junagadh (-1.17%) registered negative growth rate, while it significantly increased in the state at the rate of 0.68%. The increasing demand for onion and garlic could have resulted in increase in area under these crops. Singh (2009) also reported that the area and production of onion

registered positive and significant compound annual growth rate of 3.19% and 3.42%, respectively while the annual growth in productivity of onion was 0.23% during 1978–79 to 2004–05 in India.

Garlic was not grown throughout the state. The highest positive and significant annual growth rates in terms of area, production and productivity was observed in Amreli (5.54%), Sabarkantha (13.84%) and Jamnagar (2.88%) districts (Table 2). Annual area, production and yield of the crop in the state increased

**Table 2.** Compound growth rates in area, production and yield of garlic in different districts of Gujarat

Districts	1990–91 to 2007–08		
	Area	Production	Yield
Amreli	5.54** (0.8396)	7.15** (1.0984)	0.60** (0.1537)
Bhavnagar	5.46** (0.7714)	5.91** (1.2032)	0.69** (0.1166)
Jamnagar	-1.22 (0.8233)	1.35 (0.8090)	2.88** (0.1833)
Junagadh	5.49** (0.6493)	6.84** (0.7906)	1.12** (0.2197)
Kheda	-0.36* (0.1673)	11.18** (0.7016)	0.66** (0.1154)
Panchmahals	7.54** (0.5743)	10.06** (0.6837)	0.69** (0.1166)
Rajkot	3.32** (0.9550)	5.56** (0.9412)	2.28 (0.1386)
Sabarkantha	1.22** (0.1545)	13.84** (0.4384)	0.63** (0.1184)
Gujarat	2.98** (0.6537)	4.61** (0.7162)	1.52** (0.1011)

Significant at  $P < 0.05$ ; \*\*Significant at  $P < 0.001$ ; Note: Figures in parentheses are standard errors

significantly at the rate of 2.98%, 4.61% and 1.52%, respectively during the period.

## References

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